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nomena, and the operations of which may there be modified by unexpected influences? And, finally, where is the scientist who would seriously claim that the facts he observes are not by his observation and experimentation subjected to conditions different from those in which they naturally occur? Did he so claim, of what merit would be his experimenting? It would, therefore, appear that Professor Billia has brought in his three considerations an indictment not only against laboratory psychology, but also against laboratory methods generally. The aim of scientific method is to discover what the facts of nature will disclose when subjected to conditions of controlled experimentation. It is that which gives to experimental science its great power, which makes it a remarkable human achievement, and which places its results, measured by the standard of usefulness, so far in advance of the mere description of nature however beautiful and however suggestive.

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Aus der Werkstatt der Experimentellen Psychologie und Pädagogik. Herausgegeben von RUDOLPH SCHULZE. Mit besonderer Berücksichtigung der Methoden und Apparate. Nebst zwei Anhängen: I. Ein Neues Chronoscope. II. Instrumentarium für Seminare. Zum Selbststudium und zur Belebung des Psychologischen Unterrichts an Seminaren und andern höheren Unterrichtsanstalten. Mit 314 Abbildungen. Leipzig: R. Voigtländers Verlag. 1909. Pp. 292.

The author has stated the purpose and character of his book in the title. It consists of a description of the methods and apparatus of the modern psychological and pedagogical laboratory, and is intended for use in normal schools and for general reading by teachers and others who are interested in the methods of the newer psychology. It does not, therefore, pretend to be original in its material, but rather in the form of its presentation and in the scope of its contents. The form is determined by the character of the audience to which it is addressed, and the book is, therefore, written in a simple style and does not presuppose a knowledge of even the most elementary laboratory apparatus. It is, moreover, profusely illustrated so that the reader can get as clear and accurate an idea of the apparatus as is possible without direct contact with it.

The scope of the book may be indicated by the statement that it includes not only the ordinary methods of the psychological laboratory as well as certain others which are distinctly pedagogical in their character, but also an elementary presentation of the classical methods in the narrower sense of the term—the method of errors, etc. Furthermore, the author gives at the end an explanation of the mathematical procedure by which the amount of correlation between different mental processes is determined.

It is, of course, a necessary consequence of such breadth of scope and of the numerous illustrations—many of them full-page—that the treatment must be brief. The author often contents himself with merely an indication of the various methods by which a given subject may be investigated, with perhaps a statement as to which is best suited for pedagogical experiments and a very brief indication of the results which have been obtained. The reader obtains, so to speak, a bird's-eye view of the field of laboratory investigation with emphasis on the methods rather than on the results.

It has been said that a knowledge of psychological apparatus is not assumed. This is true. But a knowledge of the fundamental principles of psychology, while not explicitly assumed, is necessary for the appreciation of the significance of the methods described. The book is suited, therefore, to serve as a companion to a general psychology, but not as an introduction to the science. For his psychology the author holds, point for point, to Wundt's classification and treatment (as he himself clearly states), omitting only certain sections with which no experimental methods are directly connected. On the pedagogical side the author relies on Meumann's recent "Vorlesungen zur Einführung in die Experimentelle Pädagogik." He also draws, however, from a large body of special literature and has brought together a compilation from a very wide field.

The American reader will find himself unfamiliar with much of this literature, since it exists in German school and pedagogical periodicals. As an example may be cited a review of some work which the author himself published in *Neue Bahnen*. This work consisted in a study of the expressions assumed by children when looking at pictures which have various kinds of emotional effect. These expressions he calls "mimicry." The method was to choose twelve pictures, let a class of children look at them, and photograph them during the contemplation. These photographs were then laid before three "referees" whose task was, first, to describe the emotions expressed and, secondly, to choose the picture to which each emotion corresponded. The success of the referees was very striking.

The whole book is written in a most clear and vivid style, and with a skill in presentation which gives evidence of the author's experience and ability as a teacher.

In a supplement is described a new chronoscope of the author's own device. This was constructed for the purpose of overcoming the difficulties which attend the use of the Hipp chronoscope. These difficulties arise from two sources. First, the current must be of just the proper strength so that the pull of the magnet throws the clutch in with the same rapidity as the rapidity with which the spring throws it out. Secondly, the current must not pass through the magnet in one direction for more than a short length of time; otherwise the magnet will become permanent.

Schulze's chronoscope overcomes the first of these difficulties by employing the electromagnet for throwing the clutch both in and out. Thus it is only necessary to keep the current constant in order to produce the same speed of action in the successive cases. The second difficulty is overcome by employing an induction current instead of a direct current. Since the induction current is only a momentary current set up by opening or closing the primary circuit, it is impossible to set up a continuous current in the coils which operate the clutch. And since a "make" of the primary circuit must always be alternated by a "break," the coils must have an equal number of currents passing through them in the one direction and in the other.

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An Experimental Study of Sleep. BORIS SIDIS. Boston: Badger. 1909. Pp. viii + 106.

In this work the author records the results of numerous experiments on the production of sleep in animals and in children, the characters of reactions found in sleeping individuals, and uses this material to construct a theory of sleep. In the discussion of his results we find much on allied states, hypnoidal and hypnotic, as well as on sleep. Much of the experimental part is similar to and in accord with the work of Heubel, and in the theoretical portion the main view-point of Claparède is taken.

Emphasis is laid on the psychic factors in sleep and any supposition of toxic influences or conditions is shown not to be necessary, and, in fact, to be contrary to certain facts that have been observed.

In addition to the three states commonly considered to be the only possibilities, sleep, waking, and hypnosis, Sidis differentiates a fourth state, intermediate between the hypnotic and sleep states, to which he has given the name hypnoidal. This state we pass through when going to sleep and also when awaking. We also have to pass through this state when being placed in a hypnotic condition, and we pass through it when returning to normal from the hypnotic state. An individual may be asleep, be partly "waked," and thus put into the hypnoidal state, and thence led into the hypnotic state. In this way the relationship of hypnosis and sleep is much more easily understood. At times it appears as if the author identified this intermediate, hypnoidal state with all subwaking states, but it is difficult to determine whether or not he believes the hypnoidal to be a special kind of subwaking state. This intermediate state is given two names, hypnagogic and hypnapagogic, depending upon the condition to which it leads, sleep or wakefulness.

It is in this intermediate state that Sidis locates dreams, for in it he finds a crowd of hallucinations. Another work is promised on this interesting topic, and we need not prematurely consider the author's views on the matter at the present time.

The general position of Claparède is taken, viz., that sleep is not a disease, it is not a pathological state, it is not due to toxins or autointoxication, and is not caused by cerebral or nervous anemia or hyperemia. Sleep is an active function, "as much of an instinct as hunger or sex." "Phylogenetically and ontogenetically, the sleep states of higher animals are developed out of undifferentiated, intermediary, subwaking, hypnoidal-like states found in the resting states of the lower representatives of animal life. The hypnoidal state is the primitive rest state out of which sleep arises. Briefly put, the hypnoidal state is the germ of sleep. Physiologically and psychologically considered, sleep is an actively induced passive state in relation to the external environment; the psychophysical systems have their threshold raised in relation to the external